

NEW FRESH-WATER AND MARINE BIVALVE SHELLS FROM BRAZIL AND URUGUAY

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The Brazilian pearly fresh-water mussel described in this paper came from Arcas, Minas Geraes, Brazil, and was presented by Mr. Ralph W. Jackson, of Cambridge, Md. The other four came from Canada Grande, Department of Cerro Largo, Uruguay. These and the three marine shells, which came from the southeast coast of Uruguay, were presented by Dr. F. Felippone, of Montevideo, Uruguay.

DIPLODON JACKSONI, new species

Plate 4, figures 1-3

Shell moderately thick, especially in the anterior portion; nearly elliptic, slightly oblique, regularly rounded in front, more sharply rounded at the rear. Dorsal margin gently arched; ventral margin slightly sloping downward from front to back; posterior margin fusing imperceptibly into the dorsal margin. Surface of the shell with an obscure depression running from the beak to a point just back of the middle of the ventral margin. Beaks set far forward; anterior area small and rapidly descending from the ridge to the anterior margin. Posterior area large; the posterior ridge low and rounded. Sculpture consisting of weak concentric striae, with the rest periods more plainly marked. Color greenish with a metallic luster, especially when the shell is wet. Interior bluish and livid, with but little iridescence. Anterior adductor scars deep and the pedal muscle scars deeply punched; posterior scars superficial. In the right valve there is one long, slightly curved lateral tooth, its summit granulated; and two pseudocardinal teeth set parallel to the anterior dorsal margin, the upper tooth small and platelike, the lower one thicker and fluted on its surface. Left valve with two lateral teeth, and one pseudocardinal nearly divided into two parts by an oblique pit. Pallial line well marked. Beaks with about 20 radiating

ridges, those in front of the middle weaker than those in the rear. The middle pairs at each stage of growth fuse into a point, each pair "nesting" into the succeeding pair like V in V. The early shell has numerous concentric threads which are more prominent in the spaces between the ridges than on the summits. On the posterior dorsal area of the young shell there are several obscure flutings running from the hindmost radial rib to the dorsal margin.

The type (Cat. No. 368260, U.S.N.M.) measures: Length, 49 mm.; height, 28 mm.; diameter, 16 mm. A paratype (Cat. No. 368261, U.S.N.M.) measures: Length, 47 mm.; height, 24.5 mm.; diameter, 15 mm. They were presented by Mr. Ralph W. Jackson, of Cambridge, Md., and come from Arcas, Province of Minas Geraes, Brazil. This locality is on a small tributary, near the source of the Rio Sao Francisco, which flows in a general northeasterly course and enters the Atlantic at about 11° south latitude. Both specimens are unusually well preserved and have the beak sculpture in nearly perfect condition. The species is closely related to *Diplodon santamariae* Simpson, but is less quadrate, has the ventral margin more oblique, and has the undulations of the beaks finer, closer, and covering only about half as much area. The color of *D. santamariae* is rich chestnut brown, while *D. jacksoni* is greenish with metallic luster. Evidently it is related to and groups with *D. wagnerianus* Simpson (+ *ellipticus* Wagner), a species occurring in the Rio Sao Francisco.

DIPLODON PILSBRYI, new species

Plate 1, figures 1 and 3. Plate 3, figure 2

Shell rather inflated, oval in outline, rounded in front, obtusely pointed at the rear, rather thin for its size and genus. Dorsal line arcuate, fading into the posterior margin without a pronounced angle, joining the anterior margin at nearly a right angle. Ventral margin curved throughout its whole length, broadly rounding into the anterior margin and making a rounded point with the posterior margin. Beaks at about the anterior quarter of the length. Posterior ridge high and rounded and descending gradually to the posterior margin. Descent at the anterior end steep. Sculpture of numerous, concentric lines of growth, the posterior area with two obscure radiating riblets. Rest periods about five, indistinct. Color uniform dark chestnut. Left valve with one pseudocardinal tooth which is long, compressed, and rather low. Right valve with two long, low, compressed pseudocardinals, the groove between them narrow and shallow. Left valve with two low lateral teeth of nearly equal size, beginning a little remotely from the beak. Right valve with one rather high, thin lateral, its upper margin crenulated. Anterior adductor scars deep, posterior ones well impressed. Beak cavities

with a row of muscle scars deeply punched. Nacre faded and diseased, evidently white when normal. Pallial line well marked, located about 10 mm. above the ventral margin.

The type (Cat. No. 368237, U.S.N.M.) measures: Length, 97 mm.; height, 53 mm.; diameter, 30 mm. It comes from Canada Grande, Department of Cerro Largo, Uruguay, and was presented by Dr. Florentino Felippone.

This species will for the present stand by itself, as it shows but little relationship to any species hitherto described. The beaks are deeply eroded and but little may be said of their characters. The right beak gives indications that its sculpture consisted of five or six very strong radiating ribs. In form the shell is very similar to many specimens of the common *Anodonta cataracta* Say of the eastern United States. If lying with a lot of that species it would pass as a slight variation of it.

The species is named in honor of Dr. H. A. Pilsbry.

ANODONTITES ELFA, new species

Plate 4, figures 4-6

Shell rather small and thin, ovate-elliptic, narrow and rounded in front, broad and obtusely pointed at the rear. Dorsal edge nearly straight, rounding into the anterior margin, and joining the posterior margin in a very obtuse angle. Beaks set about 16 mm. behind the anterior end, and 40 mm. in front of the posterior end. General surface of the shell rounding to the margins without making a distinct ridge at either end. Descent to the posterior margin gradual; to the anterior margin rather abrupt. Sculpture of concentric growth striae and several more distinct lines indicating rest periods, and hints of radiating ruffles. Periostracum smooth and glossy at the front and middle of the shell, posterior area much roughened by lamellae of fugacious periostracum. Color bipartite, rich dark chestnut anteriorly, lighter chestnut posteriorly, the line of separation of the two tints running from the beak to the middle of the ventral margin. Interior much faded and chalky, but evidently greenish in color and with apparent radiating striae. Anterior adductor scars lightly impressed, posterior scars superficial. Prismatic margin very broad near the anterior end of the ventral margin and here the interior is flattened instead of concave. Pallial line about 6.5 mm. above the ventral margin.

The type (Cat. No. 368998, U.S.N.M.) measures: Length, 56 mm.; height, 32 mm.; diameter, 18 mm. It comes from Canada Grande, Department of Cerro Largo, Uruguay and was presented by Doctor Felippone. Cat. No. 368999, U.S.N.M., includes one right valve and one left valve, not mates, from the same locality. Cat. No. 335740,

U.S.N.M., includes a specimen from Rio Tacuari, Department of Cerro Largo, also from Doctor Felippone.

Despite its greater length as compared with its height, this shell is closely related to the plentiful *Anodontites patagonicus* Lamarek (*A. latomarginatus* Lea). This relationship is indicated by the very broad prismatic border and the bipartite coloring of both species. The darker coloring covering the surface from the front to the middle probably indicates the depth to which the shell buries itself in the mud or sand.

ANODONTITES MANSFIELDI, new species

Plate 2, figures 1-3

Shell moderately thick and inflated, subquadrate-elliptic, rounded at both ends, both the dorsal and ventral margin slightly arcuate. Beaks set well forward, about 15 mm. from the anterior end, 50 mm. from the posterior end. Shell rounding from the high middle to the anterior and posterior margins without distinct ridge at either end. Sculpture of well-marked concentric riblets indicating periods of rest in growth. Periostracum smooth and glossy. Color rich, reddish-chestnut, with two radiating greenish rays on the posterior dorsal area. Interior livid and rose color, the latter color richer in the adductor scars and in the area between the pallial line and the margin. Prismatic border still darker, pallial line about 8 mm. from ventral margin. Anterior adductor scar well impressed, the posterior one lightly impressed.

The type (Cat. No. 368254, U.S.N.M.) measures: Length, 65 mm.; height, 37 mm.; diameter, 23 mm. It comes from Canada Grande, Department of Cerro Largo, Uruguay, and was presented by Doctor Felippone.

In color, periostracum, interior features, especially color and in the width of the prismatic border, this shell is related to *Anodontites wymani* Lea. In form the relationship is not so evident, as *Anodontites mansfieldi* is subquadrate-elliptic, while *Anodontites wymani* is ovate, narrow in front, and rather sharply pointed at the rear. The species is named in honor of Dr. W. C. Mansfield, of the United States Geological Survey.

MYCETOPODA FELIPPONEI, new species

Plate 1, figure 2. Plate 3, figures 1 and 3

Shell elongate, oblique, very compressed, much narrowed in front, broad near the rear, and ending in a broadly rounded point at the posterior end, gaping from the point at which the dorsal margin joins the anterior margin to a point behind the middle of the ventral

margin. Dorsal line nearly straight, fading without an angle into the posterior margin, which in turn sharply rounds into the ventral margin. Ventral margin very lightly curved, sloping up to and gradually rounding into the anterior margin. Beaks set back about 20 mm. from the extreme anterior margin and 75 mm. in front of the extreme posterior point. Posterior ridge somewhat angular, but low, with the descent to the margins gradual. Anterior ridge rounded, set close to the anterior margin. Sculpture of poorly marked concentric lines of growth and obscure radiating striae, with indications of a few radiating ruffles. Color nearly uniform light chestnut. Interior rich pink lavender.

The type (Cat. No. 368235, U.S.N.M.) measures: Length, 95 mm.; height, 38 mm.; diameter, 20 mm. It comes from Canada Grande, Department of Cerro Largo, Uruguay, and was presented by Doctor Felippone.

This species is closely related to *Mycetopoda legumen* von Martens and naturally groups with it, but is much narrower in front and more oblique.

CORBULA URUGUAYENSIS, new species

Plate 4, figures 7-9

Shell rather thick, subquadrate, rounded in front, shortly truncate at the rear, the left valve smaller than the right and closing into it slightly. Dorsal line angularly arched, ventral margin slightly curved, rounding regularly into the anterior margin, and making a sharp angle with the posterior margin, the left valve more nasute than the right valve. Anterior ridge rounded, posterior ridge sharply angled; posterior area in each valve flattened, biangulate on the margin. Sculpture of many flattened, nearly regular, concentric riblets and minor concentric striae. Left valve with a prominent overhanging Mya-like chondrophore just back of the tip of the beak, and a partly hooded, concave plate just in front of it to accommodate the cardinal tooth of the right valve. Right valve with a large lightly curved cardinal tooth and an obscure, shelflike chondrophore just back of it. Color creamy-white where periostracum has disappeared from most of the shell. In left valve periostracum remains on the posterior area and in a narrow strip along the ventral margin. It is brownish, is concentrically lamellate and scaly.

The type (Cat. No. 368243, U.S.N.M.) measures: Length, 11 mm.; height, 7 mm.; diameter, 5 mm. It and four paratypes (Cat. No. 368244, U.S.N.M.) come from Cape Santa Maria, Department of Rocha, Uruguay, and were presented by Dr. Florentino Felippone.

NUCULA FELIPPONEI, new species

Plate 4, figures 10-12

Shell oblique, its dorsal margin sharply arched, its ventral margin regularly curved, anterior margin long and gently sloping; posterior margin very short, abruptly descending, making a prowlike point at its junction with the ventral margin. Beaks far back, about 3 mm. in front of extreme posterior end, and 12 mm. to the rear of the extreme anterior end, curving backward, cordate, an elongated, deeply impressed, heart-shaped escutcheon below them. Anterior area flattened, anterior ridge well marked, but rounded. Sculpture of many obscure concentric striae of growth, the rest periods somewhat emphasized. Periostracum very smooth and shining, paperlike, tending to peel off, its color light olive at the beaks, darker olive on the disk, becoming straw color near the margin. Chondrophore spoonlike, overhanging in each valve, pointing toward the postero-ventral margin, free from the posterior margin, but attached by a portion of its edge to the anterior margin. Interior white, pearly, appearing to be radially striated, the anterior margin with about 20 pearly teeth and the short posterior margin with 11. Margin not crenulated. Anterior adductor scar lightly impressed, the posterior one deep.

The type (Cat. No. 368245, U.S.N.M.) measures: Length, 12 mm.; height, 12 mm.; diameter, 8 mm. It was taken from the stomach of a fish—a croaker—in South America called a Corbina, *Micropogon undulatus* Linnaeus, in the Rio de la Plata, Uruguay, and was presented by Doctor Felippone. Cat. No. 368246, U.S.N.M. includes three paratypes.

NUCULA URUGUAYENSIS, new species

Plate 4, Figures 13-15

Shell very oblique, sharply rounded at the front, widely rounded at the rear. Dorsal margin angularly arched, posterior margin short, truncately sloping; anterior margin long, lightly arched, gently sloping. Beaks set far forward, almost directly above the posterior margin; curving backward a distinct lunule below them. Escutcheon transversely fluted with curving, waving, somewhat interrupted granulose riblets. Anterior area with numerous flutings of the same nature, disposed to bifurcate at the anterior ridge. Anterior margins and margins of escutcheon obscurely scalloped, ventral margin internally finely, closely crenulated. Sculpture of close, flat concentric striae, the grooves between them linear and clean-cut. Whole surface microscopically radiately striate. Interior white, pearly. Posterior teeth 7 in number, anterior 13. Chondrophore an elongate wedge-

shaped groove in a plate extending from the base of the upper anterior tooth to the base of the upper posterior one. Color white, due probably to the loss of the periostracum.

The type (Cat. No. 368228, U.S.N.M.) consists of a single valve, and measures: Length, 5.5 mm.; height, 5.5 mm.; diameter if both valves were present would be about 2.75 mm. It comes from the coast of Maldonado, Uruguay. Cat. No. 368229, U.S.N.M., includes five unmatched valves, paratypes. Cat. No. 368252, U.S.N.M., includes three unmatched valves from Cape Santa Maria, Department of Rocha, Uruguay. Both localities are in the estuary of the Rio de la Plata. All the specimens were presented by Dr. Florentino Felippone.

EXPLANATION OF PLATES

PLATE 1

- Fig. 1. *Diplodon pilsbryi*, new species.
 2. *Mycetopoda felipponei*, new species.
 3. *Diplodon pilsbryi*, new species.

PLATE 2

- Figs. 1-3. *Anodontites mansfieldi*, new species.

PLATE 3

- Fig. 1. *Mycetopoda felipponei*, new species.
 2. *Diplodon pilsbryi*, new species.
 3. *Mycetopoda felipponei*, new species.

PLATE 4

- Figs. 1-3. *Diplodon jacksoni*, new species.
 4-6. *Anodontites elfa*, new species.
 7-9. *Corbula uruguayensis*, new species (enlarged).
 10-12. *Nucula felipponei*, new species (enlarged).
 13-15. *Nucula uruguayensis*, new species (enlarged).

